

MARCH/FY06

PINE BLUFF ARSENAL
Arkansas

**Army Defense Environmental
Restoration Program
Installation Action Plan**

Final 4 May 2006

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year Installation restoration Program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions.

In an effort to coordinate planning information between the IRP manager, AEC, installations, executing agencies, regulatory agencies, and the public, an IAP has been completed for Pine Bluff Arsenal. The IAP is used to track requirements, schedules and budgets for all major Army installation restoration programs.

All site specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

The following agencies contributed to the formulation and completion of this Installation Action Plan at the IAP Workshop held 8 March 2006:

Arkansas Department of Environmental Quality

US Army Environmental Center

Engineering and Environment, Inc. for USAEC

US Army Corps of Engineers, Tulsa

Pine Bluff Arsenal

Acronyms & Abbreviations

AEDB-R	Army Environmental Database - Restoration
ADEQ	Arkansas Department of Environmental Quality
ADRA	Ammunition Demilitarization and Renovation Area
AR	Arkansas
ARK-LA	Arkansas - Louisiana
BCM	Buried Chemical Munitions
BRAC	Base Realignment and Closure
BZ	Benzilate
CAO	Consent Administrative Orders
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CMS	Corrective Measure Study
CN	Cyanide
COE	Corps of Engineers
CS	Chlorobenzylidenemalononitrile (Tear gas)
CTT	Closed, Transferred and Transferring
CWTC	Central Waste Treatment Lagoon
cy	cubic yard
DDT	Dichlorodiphenyltrichloroethane
DERA	Defense Environmental Restoration Account
DM	Adamsite (arsenic and vomiting agent)
DMM	Discarded Military Munitions
DRMO	Defense Reutilization and Marketing Office
EPA	Environmental Protection Agency
EOD	Explosive Ordnance Division
ER,A	Environmental Restoration, Army (formerly called DERA)
FFSRA	Federal Facility Site Remediation Agreement
FS	Feasibility Study
ft	foot
FY	Fiscal Year
GB	Phosphonofluoridic acid (Sarin gas)
GW	Groundwater
HC	Hexachloroethane
HDPE	High Density Polyethylene
HRR	Historical Record Review
IAP	Installation Action Plan
IC	Incinerator Complex
IRA	Interim Remedial Action
IRP	Installation Restoration Program
LTM	Long-term Management
MC	Munitions Constituents
MCA	Military Construction, Army
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern

Acronyms & Abbreviations

MMRP	Military Munitions Response Program
NE	Not Evaluated
NCO	Non-commissioned officer
NCTR	National Center for Toxicological Research
NFA	No Further Action
NFRAP	No Further Remedial Action Plan
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NSSTP	North Sanitary Sewer Treatment Plant
OB/OD	Open Burning/Open Detonation
PA	Preliminary Assessment
PBA	Pine Bluff Arsenal
PY	Prior Year
QA	Quality Assurance
RA	Remedial Action
RADD	Remedial Action Decision Document
RA(O)	Remedial Action - Operation
RAB	Restoration Advisory Board
RACER	Remedial Action and Cost Engineering Requirement
RAP	Remedial Action Plan
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RECAP	Risk Evaluation/ Corrective Action Program
REM	Removal
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SI	Site Inspection
SVOC	Semi-Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TCE	Trichloroethylene
TCOE	Tulsa Corps of Engineers
TDP	Technical Data Pack
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substance Control Act
TX	Texas
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAEC	United States Army Environmental Center
USAEHA	United States Army Environmental Hygiene Agency (now USACHPPM)

Acronyms & Abbreviations

USATHAMA	United States Army Toxic and Hazardous Material Agency (now USAEC)
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
VX	Phosphonothioic acid (Nerve agent)
WGI	Washington Group International
WP	White Phosphorous

Acronyms & Abbreviations

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) Acronym Conversions

CERCLA

Preliminary Assessment (PA)

=

RCRA

RCRA Facility Assessment (RFA)

Site Inspection (SI)

=

Confirmation Sampling (CS)

Remedial Investigation/
Measures Feasibility Study (RI/FS)

=

RCRA Facility Investigation/Corrective
Study (RFI/CMS)

Remedial Design (RD)

=

Design (DES)

Remedial Action (Construction)
(Construction) (RA(C))

=

Corrective Measures Implementation
(CMI(C))

Remedial Action (Operation)
(Operation) (RA(O))

=

Corrective Measures Implementation
(CMI(O))

Long-Term Management (LTM)

=

Long-Term Management (LTM)

Interim Remedial Action (IRA)

=

Interim Measure (IM)

CERCLA and RCRA Underground Storage Tank (UST) Acronym Conversions

CERCLA

Preliminary Assessment (PA)

=

RCRA UST

Initial Site Characterization (ISC)

Remedial Investigation (RI)

=

Investigation (INV)

Feasibility Study (FS)

=

Corrective Action Plan (CAP)

Remedial Design (RD)

=

Design (DES)

Remedial Action (Construction)
(RA(C))

=

Implementation (Construction) (IMP(C))

Remedial Action (Operation)
(RA(O))

=

Implementation (Operations) (IMP(O))

Long-Term Management (LTM)

=

Long-Term Management (LTM)

AEADB-R to Alias Conversion

Group I SWMUs

AEADB-R #	Alias
PBA-1	SWMU 3
PBA-3	SWMU 75
PBA-6	SWMU 28
PBA-7A	SWMU 22
PBA-8	SWMU 74
PBA-10	SWMU 7
PBA-11	SWMU 29
PBA-11A,B, C	SWMU 18
PBA-11D, E	SWMU 24
PBA-11F	SWMU 23
PBA-15	SWMU 32
PBA-17T	SWMU 37
PBA-18	SWMU 54
PBA-18A	SWMU 55
PBA-35	SWMU 13
PBA-36	SWMU 47
PBA-37	SWMU 46
PBA-40A	SWMU 44
PBA-55	SWMU 14
PBA-56	SWMU 15
PBA-57	SWMU 18
PBA-58	SWMU 17
PBA-59	SWMU 45
PBA-60	SWMU 66

AEADB-R to Alias Conversion

Group II SWMUs

AEADB-R #	Alias
PBA-2	SWMU 8
PBA-4	SWMU 25
PBA-7B	SWMU 19
PBA-7C	SWMU 21
PBA-7D	SWMU 20
PBA-10A	SWMU 8
PBA-12	SWMU 10
PBA-13A	SWMU 11
PBA-16A	SWMU 33
PBA-17	SWMU 36
PBA-20A	SWMU 53
PBA-20B	SWMU 60
PBA-23A	SWMU 62
PBA-24	SWMU 63
PBA-27	SWMU 68
PBA-29	SWMU 27
PBA-29A	SWMU 30
PBA-34	SWMU 4
PBA-38	SWMU 68

Installation Locale: Pine Bluff Arsenal occupies approximately 13,500 acres located in Jefferson County, AR, approximately 8 miles northwest of Pine Bluff, and 30 miles southeast of Little Rock, the state capitol.

Installation Mission: Pine Bluff Arsenal (PBA) plays a role in the Army Force Integration Process and has direct involvement in various phases of the Life Cycle Systems Management Model: from Phase 2 -- Engineering and Manufacturing Development, through Phase 3 -- Production and Deployment and Phase 4 -- Operation and Support. It produces, stores and demilitarizes conventional ammunition; serves as the Group Technology Center for illuminating and infrared munitions; serves as the Specified Mission Facility for smoke munitions and maintains the sole U. S. capability for white phosphorus fill. PBA supports the storage and destruction of the second largest stateside chemical weapons stockpile, preservation of the only permitted site east of the Rockies for acceptance of non-stockpile chemical munitions and enforcement of international treaty efforts through compliance, and education of worldwide inspectors. The Arsenal is the Joint Services' Center of Expertise for Chemical/Biological Defensive Equipment production, maintenance, testing, certification and training. PBA augments design agencies with development and engineering, prototype production, testing and evaluation, Technical Data Packages (TDPs) and concept prove-out and demonstration. PBA conducts engineering studies for product improvement; PBA ensures environmental excellence through hazardous material/waste management programs and serves the needs of Arkansas communities and the military population as the only active Army Installation in the state.

Lead Organization:

Installation Management Agency, Southwest Region

Lead Executing Agencies: *Installation (LTM)*, U.S. Army Corps of Engineers, Tulsa District

Regulatory Participation:

Federal: U.S. Environmental Protection Agency, Region VI, Site Assessment and Federal Facilities Section, Dallas, TX

State: Arkansas Department of Environmental Quality (ADEQ)

National Priorities List (NPL) Status: Non-NPL Installation, facility is under RCRA Corrective Action and corresponding state regulations.

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status: Restoration Advisory Board (RAB) has not been formed at the Pine Bluff Arsenal (PBA). Recent inquiries of interest for PBA related issues have received no responses.

Installation Program Summaries

IRP

Primary Contaminants of Concern: Pesticides (DDT), Metals (arsenic, lead, mercury, chromium), Lewisite, Mustard, Cadmium, TCE, Hexachloroethane, Pyrotechnics, Chlorinated Solvents, Phosphorous, Thermite, VOCs

Affected Media of Concern: Groundwater, Surface Water, Soil, Sediment

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 2010/2033

MMRP

Primary Contaminants of Concern: Mustard, Thermite, Metals

Affected Media of Concern: Soil, Sediments, Surface Water, Groundwater

Estimated Date for RIP/RC: 2014/2047

BRAC There are no BRAC sites at Pine Bluff Arsenal.

Installation Historic Activity:

The War Department established PBA in 1941 for the manufacture, loading and assembly of incendiary and chemical munitions. Facilities were placed in active operation in 1942. Storage magazines, laboratories, and associated administrative and support facilities were also constructed. During the ensuing two decades, chemical synthesis on the reservation produced chemicals such as chlorine, mustard, lewisite, and biologically active products. Formulations mixed or filled include incendiary bombs, white phosphorous, CS, smoke materials, and BZ incapacitating agent.

Surplus facilities were leased to a contractor in the 1950s for the synthesis of chlorine, caustics, DDT, and chlorobenzene. Biological demilitarization was completed in 1972 and the associated portion of the facility transferred to the Food and Drug Administration for the National Center for Toxicological Research (NCTR). PBA currently manufactures smoke, riot control, incendiary and pyrotechnic agents and munitions, as well as operating a protective mask rework facility, a storage depot, and other facilities.

PBA is a leader in environmental restoration activities, having made the decision to initiate programs to correct past operations of the arsenal well before regulation or law required such efforts. The U.S. Army Environmental Hygiene Agency placed 15 monitoring wells near suspected groundwater contamination in 1966. Numerous other studies and remedial actions followed through ensuing decades.

Current Activity:

PBA has submitted the final Corrective Measures Study (CMS) to the Arkansas Department of Environmental Quality (ADEQ) and is expecting to receive a Remedial Action Decision Document (RADD) in FY07. The CMS included a revised long-term management plan that is being implemented with ADEQ approval and issuance of the RADD and RCRA permit modification.

Plans for a remedial action for Site-07A were delayed until FY 8-10 due to conflicts with on-going non-stockpile projects at PBA. Some additional investigations at Site-07A were performed to address concerns from the PBA industrial hygiene officer and for justification of the planned building demolition at the site.

PBA will complete a project to include all LTM sites into a new Geographic Information System in FY06.

Program Progress:

IRP:

Pine Bluff Arsenal IRP program progress to date is discussed on Page 18 in the Overview of this document. In 2004 PBA submitted a final Corrective Measure Study to the Arkansas Department of Environmental Quality (ADEQ) and is expecting comments this FY. Upon receipt of satisfactory response to comments, ADEQ will issue a Remedial Action Decision Document (RADD) to be included in a consolidated RCRA Permit. Future scheduled work is to complete the final IRP remedial action at PBA (Site 7A) in FY 08-10.

Cleanup Program Summary

MMRP:

The Site Inspection phase was completed in FY04 by Engineering-Environmental Management, Inc. An Ecological Risk Assessment was conducted and funded by the installation and submitted to the state for review and approval. The Stakeholder Final Historical Records Review was completed in February 2005 and the Draft Work Plan was completed in March 2005. Remedial investigations are planned for two sites (Bombing Mat Vicinity and Yellow Lake Borrow Area) under the MMRP.

PINE BLUFF ARSENAL

Installation Restoration Program

Total AEDB-R IRP Sites / AEDB-R sites with Response Complete: 74/73 (13 RC are w/LTM)

Different Site Types:

16 Burn Areas	7 Storage Areas
2 Contaminated Buildings	10 Surface Disposal Areas
2 Incinerators	11 Landfills
1 Underground Tank Farm	6 Waste Treatment Plants
1 Underground Storage Tank	13 Surface Impoundment/Lagoons
2 Explosive Ordnance Disposal	3 Other

Most Widespread Contaminants of Concern: DDT, Metals, Lewisite, Mustard, Mercury, Pyrotechnics, VOCs

Media Of Concern: Groundwater, Surface Water, Soil, Sediment

Completed REM/IRA/RA:

REM: PBA-01, 02, 03, 07A, 10A, 11, 11A, 11B, 11C, 12, 20B, 29A, 34, 38

RA: PBA-04, 07B, 07C, 07D, 11D, 11E, 11F, 13A, 15, 16A, 17T, 18, 18A, 20A, 23A, 24, 27, 28

Duration of IRP

Year of IRP Inception: 1993

Year of IRP RIP/RC: 2010

Year of IRP Completion including Long-Term Management (LTM): 2033

IRP Contamination Assessment Overview

Groundwater contamination studies at PBA began in 1966 when the U.S. Army Environmental Hygiene Agency installed 15 groundwater-monitoring wells near suspected contaminated areas. Preliminary investigations found high levels of sulfate, phosphorus, nitrates, and chlorides, thus further sampling was recommended. In 1970, PBA conducted a Contaminated Areas Survey, which included reviews of past and present operations, interviews with operations personnel, and preliminary soil, surface water, and groundwater investigations.

From 1973 to 1975, more than 1600 shallow borings (about 20 feet deep) were drilled at 31 sites to determine the extent of soil contamination. The Corps of Engineers (COE) installed 111 monitoring wells in 1977 and 1978, including 49 along the perimeter of the facility and 62 at specific sites.

In 1975, a Preliminary Environmental Survey of PBA was compiled from biological and ecological studies done in the early 1970s and an ecological study plan was proposed. A variety of reports followed (see Previous Studies at the end of Contamination Assessment). The COE installed 65 additional groundwater-monitoring wells from 1981 through 1983 at sites where the potential for groundwater contamination was greatest and to act as a post-closure monitoring system. In 1983, background levels were determined for 102 soil samples and 105 groundwater samples from 17 sites. In 1987, the EPA conducted a RCRA Facility Assessment (RFA), which was used to prepare the corrective action portions of the 13-H permit.

Remedial action at some sites was started by PBA as early as 1978. By 1989, the remedial action and clean up of historical sites at PBA were completed. RCRA work plans were prepared by PBA and COE in 1990 and 1991 for Group I and II Solid Waste Management Units (SWMUs). PBA and COE have completed and submitted to the regulators the RFI for the Group I and II SWMUs and a Corrective Measure Study (CMS) for the Group II SWMUs. Most recently remedial actions at Sites-03, 11D, 11E and 11F have been completed and a final CMS was submitted for review to ADEQ. ADEQ comments on the final CMS, which includes a monitoring plan for IRP sites, are expected in late 2006. Upon receipt of a satisfactory response, ADEQ has agreed to issue a Remedial Action Decision Document (RADD) to be included in a consolidated RCRA permit for PBA operations.

Current Status: In 2004, PBA completed the final Corrective Measure Study (CMS) including a revised long-term monitoring plan that will address natural attenuation as a means of reducing future requirements for monitoring at all SWMUs that were closed in place, or with suspect continued groundwater effect (19 sites). The CMS was submitted to ADEQ in May 2004 and is currently under review.

Regulatory Status: The lead regulatory agency for PBA environmental restoration is the Arkansas Department of Environmental Quality (ADEQ), Little Rock, AR. PBA is a non-NPL site with Corrective Action requirements included in RCRA Part B Permit 1H. There were two Consent Administrative Orders (CAO) issued by ADEQ, LIS 82-093 and LIS 83-055, that deal with several of the sites included in the RCRA Facility Investigation. Past remedial actions described in the RFI documentation addressed the sites included in these CAOs.

Cleanup Exit Strategy:

PBA awaits ADEQ comments on the final CMS submitted in 2004. PBA is currently submitting documents to consolidate its RCRA permits. Upon receipt of satisfactory comment response, ADEQ has agreed to issue a Remedial Action Decision Document (RADD) for inclusion in the consolidated RCRA permit. This decision document should in effect give regulatory approval to all PBA remedial actions performed to date. Also submitted with the CMS is the PBA Groundwater Long-Term Monitoring Plan. This plan also includes ecological monitoring at some sites. This plan will be included as a regulatory requirement in the consolidated permit. PBA will perform trend analyses of natural attenuation at all identified sites, with assessments submitted at five year intervals. Recommendations to discontinue or decrease monitoring will be based on observed trends showing improved or unchanged groundwater quality over time or the decrease of contamination concentrations as compared to EPA Maximum Contamination Levels (MCL).

Due to conflicts with on-going PBA non-stockpile chemical material work in an adjacent area, remedial action work at Site 7A, Depot Storage Yard, has been delayed until FY10. Site 7A is included in the LTM plan submitted to ADEQ for review.

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1969

- Groundwater Monitoring at Pine Bluff Arsenal, Edgewood Arsenal Technical Report, No. 4287, March-69

1973

- Water Quality Geohydrologic Consultation No. 24-004-74, Pine Bluff Arsenal, United States Army Environmental Hygiene Agency, July-73

1980

- Hydrogeological Survey of Pine Bluff Arsenal, U.S. Army Engineer Waterways Experiment Station, August-80

1981

- Pine Bluff Arsenal, Technical Memorandum No. 14, Installation Restoration Activities 1970-1979, October-81

1985

- Hazardous Waste Landfill Groundwater Quality Background Assessment, Tulsa District Corps of Engineers, October-85

1986

- Groundwater Assessment Pine Bluff Arsenal, Tulsa District Corps of Engineers, December 1983, July 1985, and October 1986

ENVIRONMENTAL/BIOLOGICAL/ECOLOGICAL REPORTS

1972

- Edgewood Arsenal Special Publication, EB-SP-74025, Preliminary Environmental Survey, Pine Bluff Arsenal, December-72

1976

- Edgewood Arsenal Technical Report, EB-TR-76038, Results of Aquatic Surveys at Pine Bluff Arsenal, April-76

1984

- Lagoon Sampling and Characterization in Accordance with Appendix A Annex B, Pine Bluff Arsenal, Garver & Garver, October-84

1985

- Environmental Engineering Services for Pine Bluff Arsenal Task 002, Aquatic Bioassays, Battelle Columbus Laboratories, June-85

1988

- Final Technical Report, Environmental Engineering Services at Pine Bluff Arsenal, Task 002, Aquatic Toxicity Testing, Battelle Columbus Laboratories, May-88

GROUNDWATER MONITORING REPORTS

1983

- Groundwater Assessment Plan, Pine Bluff Arsenal, December-83

1985

- Groundwater Assessment Plan, Pine Bluff Arsenal, July-85
- Groundwater Quality Background Assessment, Runoff Control Impoundment, Pine Bluff Arsenal, October-85
- Groundwater Quality Background Assessment, Hazardous Waste Landfill, Pine Bluff Arsenal, October-85

1986

- Groundwater Quality Detection Monitoring Assessment, Hazardous Waste Landfill, Pine Bluff Arsenal, October-86
- Groundwater Assessment, Pine Bluff Arsenal, October-86

1987

- Demonstration Report, Source of Significant Increases in Parameters, Hazardous Waste Landfill and Runoff Control Impoundment, Pine Bluff Arsenal, January-87
- Statistical Procedures Evaluation and Detection Monitoring Assessment, Hazardous Waste Landfill and Runoff Control Impoundment, Pine Bluff Arsenal,

1988

- Groundwater Quality Detection Monitoring Assessment, Hazardous Waste Landfill and Runoff Control Impoundment, Pine Bluff Arsenal, June-88
- Groundwater Quality Background Assessment, Hazardous Waste Landfill FY-86, Pine Bluff Arsenal, August-88
- Groundwater Quality Detection Monitoring Assessment, Hazardous Waste Landfill and Runoff Control Impoundment, Pine Bluff Arsenal,

1989

- Groundwater Quality Detection Monitoring Assessment, FY-86 Hazardous Waste Landfill, Pine Bluff Arsenal, October-89

1991

- FY-83 Hazardous Waste Landfill Groundwater Assessment, Pine Bluff Arsenal, January-91
- FY-86 Hazardous Waste Landfill Groundwater Assessment, Pine Bluff Arsenal, January-91
- Runoff Control Impoundment, Groundwater Assessment, Pine Bluff Arsenal, January-91
1992-2006
- FY-83 Hazardous Waste Landfill Groundwater Assessment, Pine Bluff Arsenal
- FY-86 Hazardous Waste Landfill Groundwater Assessment, Pine Bluff Arsenal
- Runoff Control Impoundment, Groundwater Assessment, Pine Bluff Arsenal

SITE CLOSURE PLANS BIBLIOGRAPHY

1984

- Site Closure Plan, Site 20A, Depot South Burning Pit, Tulsa District Corps of Engineers, January-84
- Site Closure Plan, Site 10A, Depot Demolition and North Open Burning Area, Tulsa District Corps of Engineers, July-84
- Site Closure Plan, Site 17, Product Assurance Test Range and Dump Site, Tulsa District Corps of Engineers,
- Site Closure Plan, Site 16A, White Phosphorus Landfill, Tulsa District Corps of Engineers, December-84
- Site Closure Plan, Site 27, BZ Pond, Tulsa District Corps of Engineers, December-84

1985

- Site Closure Plan, Sites 2, 20B, 26, 31A, & 31B, Tulsa District Corps of Engineers, February-85
- Site Closure Plan, Site 34, NCTR Equalization Pool, Tulsa District Corps of Engineers, June-85
- Site Closure Plan, Site 38, Impregnite Sludge Lagoon, Tulsa District Corps of Engineers, June-85
- Site Closure Plan, Site 4A, Burn Site at 504th Street, Tulsa District Corps of Engineers, July-85
- Site Closure Plan, Site 12, Mustard Burning Pits, Tulsa District Corps of Engineers, July-85
- Site Closure Plan, 13A, Abandoned McCoy Road Burn Pit, Tulsa District Corps of Engineers, July-85
- Site Closure Plan, Site 23A, HC Smoke Test Pond, Tulsa District Corps of Engineers, July-85

1985 (Con't)

- Site Closure Plan, Sites 2, 10A, 17, 20A, 26, 27, 31A, & 31B, Supplement No. 1, Tulsa District Corps of Engineers, July-85
- Site Closure Plan, Site 24, Thermite Disposal Area, Tulsa District Corps of Engineers, August-85
- Site Closure Plan, Site 29 Solid Waste Ark-La Site and Site 29A Salt Pile, Tulsa District Corps of Engineers, August-85
- Site Closure Plan, Sites 7B, 7C & 7D, Tulsa District Corps of Engineers, September-85

1996

- Draft Corrective Measures Study, Tulsa District Corps of Engineers, CDM Federal, August-96

2002

- Interim Measures Data Collection Summary Report, Tulsa District Corps of Engineers, WGI, June-02

2005

- Final Corrective Measures Study, Tulsa District Corps of Engineers, Washington Group International, May-05

2006

- Final DDT Soil Remedial Action Construction Report, SWMUs 23, 24 and 75, Tulsa District Corps of Engineers, Shaw Environmental, March-06

PINE BLUFF ARSENAL

Installation Restoration Program Site Descriptions

PBA-04 504TH STREET BURN SITE

SITE DESCRIPTION

PBA-04 (SWMU 25), a 5-acre burn site, is located in the northwestern part of the PBA, southwest of the intersection of 504th Street and 6242 Avenue. A large burn area, measuring about 600 x 300 feet, existed where most of the burn activity occurred. An elongated depression on the north end of this area was a filled-in dumpsite containing rusted 55-gallon drums, railroad ties and other debris. The site was used as a burning area for various production wastes. Due to a low-permeability clay-shale layer underlying the site, in-situ encapsulation of the waste materials was the method of remediation (1987). Lead and chromium was detected in the waste.

The RFI was submitted to regulators in 1991. Additional wells were installed in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that included long-term management with groundwater monitoring.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals (Lead, Chromium)

MEDIA OF CONCERN:
Groundwater

PHASES	Start	End
PA.....	198008	198008
SI.....	198008	198008
RI/FS	198309	198507
RD	198610	198709
RA(C).....	198712	198812
LTM	198909	203301
RC:	198812	

CLEANUP STRATEGY

PBA is awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site is included in the installation-wide, long-term groundwater monitoring program. Five wells will be monitored (3 wells will be monitored semi-annually and 2 wells annually), plus a five year program review will be conducted, beginning in FY07.

DEPOT STORAGE YARD (SWMU 22) (PAGE 1 OF 2)**SITE DESCRIPTION**

PBA-07A, a 40-acre fenced storage area, is located off Doolittle Road, southeast of the intersection of Doolittle and Webster Roads. This site contained drums of a corrosive screening smoke made of sulfur trioxide and chlorosulfonic acid, pesticides, along with “empty” blister agent (mustard and lewisite) containers. All deteriorated barrels and visible areas of surface soil contamination were removed in 1984. This unit was used for storage only, not for disposal of hazardous or non-hazardous materials.

A decontamination facility has been constructed to clean and dispose of these containers. The cost for the cleaning and disposing is non-ER,A funded. Remediation has been limited to run-on/run-off control structures (concrete berms and containment ditch) and an HDPE-lined retention pond.

In response to ADEQ concerns, a soil-gas survey over the 40-acre site was performed in FY01. Soil samples were taken and additional monitoring wells were installed in FY02. Metals were found above screening criteria in soil samples around Building 55-320. The building is considered to be the likely source of the soil contamination based on historical knowledge and perimeter sampling and analysis. Groundwater samples in the area have shown solvents above MCLs, as well as detections of lead and mercury.

In May 2004, a CMS was finalized that suggested soil remediation and long-term management with groundwater monitoring.

Additional soil samples were taken in Feb FY06 to evaluate the need for building demolition which indicated some metals contamination above EPA Region VI MSSL underneath a portion of the building.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:

Mustard, Arsenic, Mercury,
Chromium, Lead, TCE

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA	197702	197708
SI	198008	198008
RI/FS.....	200007	200308
RA(C).....	200310	201001
LTM.....	201002	203301
RC: 201001		

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

DEPOT STORAGE YARD (SWMU 22) (PAGE 2 OF 2)

Current proposed plan includes the possible demolition of Building 55-320 and soil removal for metals around and underneath the perimeter of building. Building demolition was originally believed to be necessary for two reasons: 1) the building interior is considered to be a continuing source of contamination and 2) excavation of contaminated soils underlying the building would compromise the structural integrity of the building. The Army initiated work for the Non-Stockpile Chemical Material Program adjacent to the site during FY04 with projected completion scheduled prior to FY08. Remedial action work at the site will be delayed until the non-stockpile project is completed. The site will be included in the installation-wide, long-term groundwater-monitoring program. Four wells are sampled (2 wells are sampled semi-annually and 2 wells are sampled annually) for metals, VOCs, SVOCs, chloride and sulfate.

PBA-07B

LEWISITE DISPOSAL AREA (SWMU 19)

SITE DESCRIPTION

PBA-7B, an unlined, four-acre, breached lagoon, is located in the north central part of the PBA, south of Webster and east of Atkisson Roads, and southwest of the Depot Storage Yard, PBA-7A. This site was used for the burning and disposal of lewisite along with mercury, a catalyst used in production. Vegetation was non-existent. The abandoned lagoon contained demilitarized lewisite as a white sludge up to 7 feet deep.

Remediation was achieved by capping with a flexible membrane lined clay cover and 3 feet of topsoil in conjunction with a slurry trench extending below the lower limits of detected contaminated soil.

In response to ADEQ concerns, additional soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Four wells will be monitored (2 wells will be sampled semi-annually and two wells will be sampled annually) for chlorides, sulfates, metals, VOCs and SVOCs, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Lewisite, Metals

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA	197705	197708
SI	198008	198008
RI/FS.....	198309	198509
RD.....	198610	198609
RA(C)	198710	198909
LTM.....	198909	203301
RC:	198909	

PBA-07C

MUSTARD AGENT BURNING YARD (SWMU 21)

SITE DESCRIPTION

PBA-7C is located in the north central part of the PBA south of Webster and west of Doolittle roads. The site consisted of a 1/2-acre mustard burning area, a drainage ditch just north of the burning area and blister agent cleanout area east of the Depot Storage Yard fence. Remediation was achieved by capping with a flexible membrane lined clay cover and 3 feet of topsoil in conjunction with a slurry trench extending below the lower limits of detected contaminated soil.

The RFI was submitted to regulators in 1991.

In response to ADEQ concerns, additional soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Mustard, Metals

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA	198008	198008
SI	198008	198008
RI/FS	198309	198509
RD	198610	198709
RA(C)	198710	198809
LTM	198809	203301
RC:	198809	

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Three wells will be monitored semi-annually for metals, chloride, sulfates, VOCs, and SVOCs, plus a five year program review will be conducted, beginning in FY07.

PBA-07D

STORAGE YARD BORROW PITS (SWMU 20)

SITE DESCRIPTION

PBA-7D is located in the north central part of PBA. It was used for the storage and disposal of mustard and mustard by-products produced at PBA. The site consisted of two water filled pits, approximately 75 feet wide and 600 feet long. These pits provided material for the construction of the Depot Storage Yard. Just east of the borrow pits, mustard and lewisite munitions were buried after World War II. These munitions were excavated and removed in 1955. Remediation was achieved by capping with a flexible membrane lined clay cover and 3 feet of topsoil in conjunction with a slurry trench extending below the lower limits of detected contaminated soil.

The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:

Metals, Lewisite, Chlorinated Solvents

MEDIA OF CONCERN: Soil
Groundwater

PHASES	Start	End
PA	197705	197708
SI	198008	198008
RI/FS.....	198309	198509
RD.....	198610	198709
RA(C).....	198710	198910
LTM.....	198910	203301
RC: 198910		

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Three wells will be monitored semi-annually for metals, chloride, sulfates, VOCs and SVOCs, plus a five year program review will be conducted, beginning in FY07.

PBA-08

NORTH HC SMOKE POT TEST POND (SWMU 74)

SITE DESCRIPTION

PBA-08 is located northeast of Doolittle Road within the northern part of PBA. This unit is a one-half acre lagoon and was used on a limited basis between 1940 and 1970 to test floating HC smoke pots.

Phase I RI work was completed in 1977. In response to draft CMS (1996) comments, additional interim measures investigations were performed. In FY02, 3 new wells were installed and soil and groundwater samples were collected. Results indicated no soil contamination. Groundwater sampling results were above MCLs for metals and VOCs.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:

Metals, VOCs

MEDIA OF CONCERN:

Groundwater

PHASES	Start	End
PA.....	197310	198110
SI	197310	198110
RI/FS	200007	200208
LTM	200209	203301
RC: 200208		

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Three wells will be monitored semi-annually for metals, chloride, sulfates, VOCs and SVOCs, plus a five year program review will be conducted, beginning in FY07.

PBA-11

OLD CHEM MANUFACTURING (SWMU-29)

SITE DESCRIPTION

PBA-11 (includes Sites - 03, 11A, 11B, 11C, 11D, 11E and 11F) is located west of Atkisson Road in the northern part of the facility and covers approximately 50 acres. Originally, the unit consisted of 168 buildings and structures. PBA manufactured non-lethal chemical agents within this unit between 1942 and 1943. During the 1950s, the unit was leased to contractors for the production of pesticides and their intermediates.

Widespread DDT contamination was found in the buildings, surrounding area and Phillips Creek. The surface contamination was removed during the 1976-77 remedial actions for PBA-11 and surrounding sites (Site-03, 11a, 11b, 11c, 11d, 11e and 11f).

In 1985, PBA began the demolition of nine large chemical manufacturing buildings and numerous smaller ones, and the excavation of 24,000 feet of industrial sewer lines. Soil was removed in 1986 from around the sewer lines and buildings. This contaminated material and soil was disposed of in the Hazardous Waste Landfill, PBA-41.

An Ecological Risk assessment was completed to answer ADEQ concerns. In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

In FY05 contamination from sites PBA-03, 11D, 11E, 11F were consolidated into one capped containment unit located within the site 11 boundary.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Funding for the LTM for Site-03, 11, 11A, 11B, 11C, 11D, 11E, and 11F will be funded under this site (18 wells) for semi-annual monitoring for metals, pesticides, VOCs, SVOCs, nitrates, chlorates, and sulfates. This LTM funding also includes ecological monitoring during the five year reviews beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Pesticides (DDT), Metals, VOCs

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

PHASES	Start	End
PA	197211.....	197503
SI.....	197701.....	197805
RI/FS.....	197809.....	200102
LTM.....	200103.....	203301

RC: 200103

PBA-20A

SOUTH DEPOT DISPOSAL AREA (SWMU 53)

SITE DESCRIPTION

PBA-20A is located in the southeastern part of PBA and within the Arkansas River floodplain, adjacent to a swampy wetland. This 5-acre pit was used for the burning of pyrotechnic mixes and other incendiary devices from 1941 to 1978. This pit contained approximately 58,000 cubic yards of burned fill and contaminated soil. Lead contamination extended to a depth of 3 feet in the soil below the burn pit.

Remediation in 1988 consisted of in-situ encapsulation since the subsurface consisted of low-permeability clay-shale layer which serves as a lower boundary and lies under the site. The contaminated materials were placed within a constructed levee that was keyed into the clay layer and covered with an impervious flexible membrane lined cover.

In response to ADEQ concerns, three additional wells were installed and soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Seven wells will be monitored (5wells will be sampled semi-annually and 2 wells will be sampled annually) for metals, chloride and sulfates, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, Phosphorous

MEDIA OF CONCERN: Soil,
Groundwater, Surface Water

PHASES	Start	End
PA	198008	198008
SI	198008	198008
RI/FS	198309	198401
RD	198610	198709
RA(C)	198710	198911
LTM	198911	203301
RC: 198911		

PBA-23A

WHITE SMOKE TEST POND (SWMU 62)

SITE DESCRIPTION

PBA-23A is located in the central southeastern part of PBA. It was originally a 5-acre wooded area containing a 1-1/2 acre pond and several small burn piles. The site was used between 1941 and 1976 as a test area for HC smoke pots and smoke grenades, and was also used as a general dump area for production-related material.

Due to a low-permeability clay-shale layer acting as a lower boundary, which lies under the site, in situ encapsulation of waste materials was the method of remediation. Contaminants are contained within the site by slurry walls along the boundary and keying the slurry walls into the underlying clay-shale layer. An impervious flexible membrane-lined cover was constructed over the top of the site to prevent vertical migration of the contaminants and provide run-on/run-off control. Approximately 51,500 cubic yards of non-RCRA wastes from sites PBA- 2, 10a, 12, 17, 20b, 26 and 31a were deposited at this site. This RA was completed in 1988.

In response to ADEQ concerns, two additional wells were installed and soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Eleven wells will be monitored (4 wells will be sampled semi-annually and 7 wells will be sampled annually) for VOCs, SVOCs, metals, chloride and sulfate, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Heavy Metals, Hexachloroethane

MEDIA OF CONCERN:
Groundwater

PHASES	Start	End
PA.....	197705	197708
SI.....	198008	198008
RI/FS.....	198309	198401
RD.....	198610	198709
RA(C).....	198710	198812
LTM.....	198812	203301
RC:	198812	

PBA-24

THERMITE DISPOSAL AREA (SWMU 63)

SITE DESCRIPTION

PBA-24 is located in the central southeastern part of the PBA, northwest of the intersection of Stokes Road and Avenue 321B. It was used as a dump for the QA Drop Tower, PBA-26, in the 1940s and early 1950s and for bomb wash from the BZ Pond, PBA-27, from 1959 to 1961. It is a 4-acre barren site that had a 3 feet thick layer of thermite and bomb wash residue, approximately 44,000 cubic yards of the contaminants and contaminated soil.

Remediation in 1988, was achieved by containment dikes and drainage ditches around the site and a HDPE liner cover system over the site to provide run-on control and eliminate vertical infiltration of surface waters, along with slurry walls, french drains and dewatering wells to lower the perched water table. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Four wells will be monitored annually for metals, chloride and sulfate, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Barium, Cadmium, Lead

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA.....	198008.....	198008
SI.....	198008.....	198008
RI.....	198309.....	200208
LTM	200209	203301
RC: 200208		

PBA-27

AGENT BZ POND (SWMU 65)

SITE DESCRIPTION

PBA-27 is located in the central southeastern part of the PBA, west of the intersection of Stokes Road and Avenue 321B and southwest of the Thermite Disposal Area, PBA-24. It is a one-quarter acre, unlined pond with sections of the side slopes stabilized with large concrete blocks. The pond was used in the 1940s for thermite waste disposal. In the 1940s and late 1960s, bomb wash containing red lead was disposed of in the pond. In 1959, thermite rounds were washed out and into this pond. From 1963 to 1966, the pond was used for disposal of BZ production waste and cyclohexane, a BZ carrier solvent agent. In 1970, the bomb wash facility was converted to an impregnate plant and wastes were disposed of in the pond.

The total contaminated material at this site is approximately 10,000 cubic yards. Due to a low-permeable clay-shale layer, which is suitable for use as a lower boundary, an on-site closure cell scheme was selected. This plan utilized a slurry wall and a compacted low-permeable soil cap to close the heavy metal contaminated materials and soil in place. The pond sediments, contaminated with several priority pollutant organic compounds, were solidified and disposed of in the hazardous waste landfill. The pond water was pumped to natural drainage.

The RA was complete in 1988. In response to ADEQ concerns, two additional wells were installed and soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required. Two additional wells were installed in FY04.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Ten wells will be monitored (4 will be sampled semi-annually and six will be sampled annually) for VOCs, SVOCs, metals, chloride and sulfates, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, SVOCs, Chlorinated Solvents

MEDIA OF CONCERN: Soil, Groundwater, Sediment

PHASES	Start	End
PA	197705	197708
SI	198008	198008
RI/FS.....	198309	198412
RD.....	198610	198703
RA(C).....	198704	198706
LTM.....	198706	203301
RC: 198706		

PBA-29

SOLID WASTE ARK-LA SITE (SWMU 27)

SITE DESCRIPTION

PBA-29 is located in the north central part of PBA, northwest of the intersection of Atkisson Road and 504th Street. It is a 40-acre site that was used in the 1940s for the manufacture of chlorine for mustard and lewisite operations. From 1950 to 1969, the site was leased to the ARK-LA Chemical Corporation, which produced chlorine for commercial purposes. All buildings and most foundations have been removed from the site.

Due to the existence of an underlying clay-shale layer, in situ encapsulation was the method chosen for closure. The site was divided into two subsites, north and south. The north subsite was contained by the use of a slurry wall that was keyed into the clay-shale layer. The south subsite and material outside the slurry wall was excavated and placed within the limits of the

slurry wall. The volume enclosed by the slurry wall was filled, graded and covered with a 40-mil HDPE flexible membrane liner. The RA was completed in 1988.

In response to ADEQ concerns, two additional wells were installed and soil and groundwater samples were collected in FY02. The remedy involved site closure with waste in place and thus long-term management is required.

In May 2004, a CMS was finalized that suggested long-term management with groundwater monitoring.

CLEANUP STRATEGY

Awaiting approval from ADEQ on the CMS. Anticipate the approval by late FY06.

This site will be included in the installation-wide, long-term groundwater monitoring program. Six wells will be monitored (4 will be sampled semi-annually and 2 will be sampled annually) for metals, chlorides, sulfates, VOCs and SVOCs, plus a five year program review will be conducted, beginning in FY07.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Lead, SVOCs, VOCs

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA	198008.....	198008
SI.....	198008.....	198008
RI/FS.....	198309.....	198508
RD	198610.....	198709
RA(C)	198710.....	198811
LTM.....	198811.....	203301
RC: 198811		

PBA-41

MCA 83 HAZARDOUS WASTE LANDFILL

(SWMU 1)

SITE DESCRIPTION

PBA-41, a RCRA-permitted hazardous waste landfill is located in the extreme northwest portion of PBA. This landfill consists of three cells. Two of the cells measure 200 x 400 feet and contain demolition wastes from the Old Chemical Manufacturing Area, PBA-11. Wastes were placed in these cells between October 1985 and October 1986. The third cell was removed in 1999.

This is a RCRA facility used for disposal of material removed during the remediation of IRP sites only. RCRA closure was achieved by capping the site. Groundwater monitoring and periodic leachate removal are the only current activities at this site.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, Pesticides

MEDIA OF CONCERN: Soil,
Groundwater

PHASES	Start	End
PA	198708.....	198711
LTM.....	198711.....	203301
RC: 198711		

CLEANUP STRATEGY

Groundwater monitoring and cap maintenance will continue as required by the post-closure permit. Ten wells will be monitored semi-annually for metals, TOX and pesticides. In FY08, construction of a leachate collection system to reduce operating and life cycle costs.

PBA-44

MCA 83 SURFACE IMPOUNDMENT (SWMU 12)

SITE DESCRIPTION

PBA-44 is a 9 acre, lined, RCRA-permitted retention pond located in the east central part of PBA. This pond functions as a settling basin that allows surface water run-off to be retained so that potential contaminants can settle out. Run-off from the Old Chemical Manufacturing Area, PBA-11, and the Chemical Munitions Storage and Dump Area, PBA-7, was diverted to the pond during the remediation of these sites. This impoundment is receiving only storm water discharge from the 545 acres that includes PBA sites 11 and 7.

This is a RCRA and NPDES permitted facility used for run-off control from IRP sites only.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN:
Metals, Pesticides

MEDIA OF CONCERN: Surface
Water, Groundwater

PHASES	Start	End
PA	198708.....	198711
LTM.....	198711.....	203301
RC: 198711		

CLEANUP STRATEGY

Groundwater monitoring and NPDES surface water monitoring will continue as required by permit. Eight wells will be monitored semi-annually for metals, TOX and pesticides.

IRP No Further Action Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	NFA Date
PBA-01	N Exclusion Area Rubble Pile, SWMU 3	NFA will be documented in the RADD expected in 2007.	200209
PBA-02	Webster Road Test Site, SWMU 8	NFA will be documented in the RADD expected in 2007.	198804
PBA-03	Old DOT Disposal Area, SWMU 75	NFA will be documented in the RADD expected in 2007.	200306
PBA-06	Old Ark-La Rubble Site, SWMU 28	NFA will be documented in the RADD expected in 2007.	200209
PBA-06S	Non-Production Waste Burning, SWMU 34	NFA will be documented in the RADD expected in 2007.	197708
PBA-07S	M50 Bomblet Primer Demolition, SWMU 73	NFA will be documented in the RADD expected in 2007.	197708
PBA-10	Bombing Mat, SWMU 7	NFA will be documented in the RADD expected in 2007.	198308
PBA-10A	Depot Demolition, N Burn Area, SWMU 8	NFA will be documented in the RADD expected in 2007.	198807
PBA-10B	Solid Waste Storage Facility, SWMU 9	NFA will be documented in the RADD expected in 2007.	198308
PBA-11A	DDT Sediment Retention Basin 1, SWMU 18	NFA will be documented in the RADD expected in 2007.	198509
PBA-11B	DDT Sediment Retention Basin 2, SWMU 18	NFA will be documented in the RADD expected in 2007.	198509
PBA-11C	DDT Sediment Retention Basin 3, SWMU 18	NFA will be documented in the RADD expected in 2007.	198509
PBA-11D	DOT Landfill, Bldg 54-270, SWMU 24	NFA will be documented in the RADD expected in 2007.	200309
PBA-11E	DOT Landfill, Bldg 54-325, SWMU 24	NFA will be documented in the RADD expected in 2007.	200309
PBA-11F	Sediments Containing DDT, SWMU 23	NFA will be documented in the RADD expected in 2007.	200409
PBA-12	Mustard Burn Pit, SWMU 10	NFA will be documented in the RADD expected in 2007.	198811
PBA-13A	Abandoned Burn Pit, SWMU 11	NFA will be documented in the RADD expected in 2007.	198711
PBA-15	Closed Sanitary and DDT Landfill, SWMU 32	NFA will be documented in the RADD expected in 2007.	197509
PBA-16A	White Phosphorus Landfill, SWMU 33	NFA will be documented in the RADD expected in 2007.	198809
PBA-17	Old Product Test Range, SWMU 36	NFA will be documented in the RADD expected in 2007.	198809
PBA-17T	Dilly Farm Test Range, SWMU 37	NFA will be documented in the RADD expected in 2007.	198711
PBA-18	Closed Sanitary Landfill, SWMU 54	NFA will be documented in the RADD expected in 2007.	200007

IRP No Further Action Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	NFA Date
PBA-18A	Current Sanitary Low Landfill, SWMU 55	NFA will be documented in the RADD expected in 2007.	200208
PBA-18B	So Arsenal Building Rubble Site, SWMU 56	NFA will be documented in the RADD expected in 2007.	198008
PBA-18C	Class IV Landfill, SWMU 57	NFA will be documented in the RADD expected in 2007.	198609
PBA-18D	Reusable Rubble Pit, SWMU 58	NFA will be documented in the RADD expected in 2007.	198609
PBA-19	Facility Burn Pit/Asbestos Landfill, SWMU 59	NFA will be documented in the RADD expected in 2007.	198609
PBA-20B	WP Slag Burn & Disposal Area, SWMU 60	NFA will be documented in the RADD expected in 2007.	198808
PBA-26	Product Assurance Test Range, SWMU 64	NFA will be documented in the RADD expected in 2007.	198806
PBA-29A	Salt Pile , SWMU 30	NFA will be documented in the RADD expected in 2007.	198811
PBA-31A	Product Assurance Test Range, SWMU 72	NFA will be documented in the RADD expected in 2007.	198803
PBA-31B	Grenade Test Basin, SWMU 71	NFA will be documented in the RADD expected in 2007.	198008
PBA-34	NCTR Equalization Pond, SWMU 47	NFA will be documented in the RADD expected in 2007.	198809
PBA-35	North Oxidation Pond, SWMU 13	NFA will be documented in the RADD expected in 2007.	198609
PBA-36	Central Waste Treatment Lagoon, SWMU 47	NFA will be documented in the RADD expected in 2007.	198809
PBA-37	South Oxidation Ponds, SWMU 46	NFA will be documented in the RADD expected in 2007.	198609
PBA-38	Impregnite Sludge Lagoon, SWMU 68	NFA will be documented in the RADD expected in 2007.	198809
PBA-39	Sanitary Pond	NFA will be documented in the RADD expected in 2007.	198609
PBA-40	Incinerator Complex, SWMU 38-41	NFA will be documented in the RADD expected in 2007.	198308
PBA-40A	IC Cooling Pond, SWMU 44	NFA will be documented in the RADD expected in 2007.	198308
PBA-40B	Solid Waste Shredder, SWMU 43	NFA will be documented in the RADD expected in 2007.	198308
PBA-40C	Waste Container Magazine at IC, SWMU 42	NFA will be documented in the RADD expected in 2007.	198308
PBA-46	Liquid Waste Storage Bldg 81, SWMU 26	NFA will be documented in the RADD expected in 2007.	198308

IRP No Further Action Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	NFA Date
PBA-47	EOD Detonation Area, SWMU 35	NFA will be documented in the RADD expected in 2007.	198609
PBA-48	BZ Demilitarization Facility	NFA will be documented in the RADD expected in 2007.	199008
PBA-49	FY86 MCA Hazardous Waste Landfill	NFA will be documented in the RADD expected in 2007.	198609
PBA-50	M55 Rocket Storage Area, SWMU 77	NFA will be documented in the RADD expected in 2007.	198512
PBA-51	WP Pollution Abatement Facility, SWMU 79	NFA will be documented in the RADD expected in 2007.	198711
PBA-52	Temp Holding or Hazardous Waste, SWMU 61	NFA will be documented in the RADD expected in 2007.	198708
PBA-53	PCB Storage Facility, SWMU 70	NFA will be documented in the RADD expected in 2007.	198711
PBA-54	WP Storage USTs (35)	NFA will be documented in the RADD expected in 2007.	199108
PBA-55	Clarifier for N. Sanitary Treatment Plant, SWMU 14	NFA will be documented in the RADD expected in 2007.	198711
PBA-56	Screen Filter N. Sanitary Sewer Treatment Plant, SWMU 15	NFA will be documented in the RADD expected in 2007.	198711
PBA-57	Sludge Drying N. Sanitary Sewer Treatment Plant, SWMU 16	NFA will be documented in the RADD expected in 2007.	198711
PBA-58	Trickle Filter N. Sanitary Sewer Treatment Plant, SWMU 17	NFA will be documented in the RADD expected in 2007.	198711
PBA-59	Sewage Clarifier System, SWMU 45	NFA will be documented in the RADD expected in 2007.	198711
PBA-60	Old BZ Production Area, SWMU 66	NFA will be documented in the RADD expected in 2007.	199709
PBA-61	Tank 33-320A	NFA will be documented in the RADD expected in 2007.	199112
PBA-62	Bombing Material Vicinity	MMRP	200502
PBA-63	Yellow Lake Borrow Area	MMRP	200409

Initiation of IRP: 1970

Past Phase Completion Milestones

- 1970** Chemical/Biological Evaluation of Stressed Sites
- 1974** Installation Assessment and Contamination Studies
- 1979** Installation of Groundwater Monitoring Wells
- 1984** Site Surface Cleanup Actions
- 1985** Hydrogeologic Studies and Closure Plans
- 1986** Remedial Actions to Old Chemical Manufacturing Area
- 1989** Remedial Actions to Close Contaminated Sites
- 1990** Description of Current Conditions June
RFI Workplan (Group I SWMUs) August
- 1991** RFI Workplan (Group II SWMUs) April
Final Report (Group I) December
- 1994** Final Report (Group II) January
- 1996** Draft CMS December
- 2000** Received comments from ADEQ on Draft CMS. Through the COE (Tulsa), solicited and acquired a contract with WGI for additional investigations and possible remediation as required by ADEQ.
- 2002** Completed a response to ADEQs comments on the CMS with the Interim Measures Summary Report.
- 2004** Submitted Final CMS to ADEQ
Completed RI at Site 63.
- 2005** Completed RA at Sites 3, 11D, 11E, 11F
PBA implemented revised LTM program.

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates: 2007

Projected Construction Completion Date of IRP: 2010

Schedule for Next Five-Year Review: 2007

Estimated Completion Date of IRP (including LTM phase): 2033

Pine Bluff Arsenal IRP Schedule

(Based on current funding constraints)

AEDB-R#	PHASE	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
PBA-04	LTM									203301
PBA-07A	RA(C)									
	LTM									203301
PBA-07B	LTM									203301
PBA-07C	LTM									203301
PBA-07D	LTM									203301
PBA-08	LTM									203301
PBA-11	LTM									203301
PBA-20A	LTM									203301
PBA-23A	LTM									203301
PBA-24	LTM									203301
PBA-27	LTM									203301
PBA-29	LTM									203301
PBA-41	LTM									203301
PBA-44	LTM									203301

PINE BLUFF ARSENAL

Military Munitions Response Program

Total AEDB-R MMRP Sites/AEDB-R sites with Response Complete: 4/2

AEDB-R Site Types

2 Open Burning/Open Detonation
1 Unexploded Munitions/Ordnance
1 Burn Area

Most Widespread Contaminants of Concern: Mustard, Thermite, Metals

Media of Concern: Soil, Surface Water, Groundwater, Sediment

Duration of MMRP

Year of MMRP Inception: 2002
Year of MMRP RIP/RC: 2014
Year of MMRP Completion Including LTM: 2047

MMRP Contamination Assessment

MMRP Contamination Assessment Overview

Four MMRP sites were identified at Pine Bluff Arsenal. The SI Phase has been completed in early FY06 finding that two of these sites have been determined to need no further action. Ecological Risk Assessment was conducted and funded by Pine Bluff Arsenal. A report was generated and submitted to ADEQ in FY06.

MMRP Cleanup Exit Strategy

Additional investigation is planned for the remaining two sites. Remediation such as waste removal and LTM may be needed.

Year

2006

- Final Site Inspection Report, Military Munitions Response Program, Site Inspection Munitions Response Sites, Pine Bluff Arsenal, Arkansas, for the US Army Corps of Engineers, Omaha District, prepared by, engineering-environmental Management, Inc., ACC Contract Number F44650-99-D-0004, January 2006.

PINE BLUFF ARSENAL

Military Munitions Response Program Site Descriptions

PBA-001-R-01

BOMBING MAT VICINITY

SITE DESCRIPTION

This site was known as PBA-62.

Bombing Mat Vicinity is approximately 40 acres in size and lies within the former impact zone for testing of thermite bombs in the 1940s. Also within the area are work zones that contain pits that were used for the demilitarization of high explosive munitions. Large quantities of metallic debris have been found scattered across the area. The discovery of empty chemical munitions bodies and glass fragments from ID sets indicate that the area may contain chemical agent contamination. The area is also in close proximity to Site-12 (Mustard Burn Pit) where remediation included the removal of mustard agent-filled German Tractor Rockets disposed of at this location during WWII.

The Army has conducted a SI which included a review of historical records and interviews with site personnel. Based on this new information, the site boundaries may be expanded based on a revised conceptual site model. An Ecological Risk Assessment was conducted and funded by PBA.

CLEANUP STRATEGY

Additional investigation is planned. Remediation such as waste removal and LTM may be needed.

STATUS

REGULATORY DRIVER: CERCLA

RAC: Serious Risk

CONTAMINANTS OF CONCERN:
Mustard, Thermite, Metals

MEDIA OF CONCERN: Soil,
Surface Water, Groundwater,
Sediment

PHASES	Start	End
PA	200203.....	200305
SI.....	200404.....	200502
RI/FS.....	201410.....	201509
RD	201510.....	201609
RA(C)	201605.....	201709
LTM.....	201710.....	204709

RC: 201409

PBA-002-R-01 YELLOW LAKE BORROW AREA

SITE DESCRIPTION

This site was known as PBA-63.

Approximately 10 acres in size, this area has been used as a borrow area for sandy soils for several years. In 2000, an unexploded 4.2 mustard mortar round was discovered in the area during the removal of borrow, making the investigation of the area for more UXO necessary.

The Army has conducted a SI which includes a review of historical records and interviews with site personnel. Based on this new information, the site boundaries may be expanded based on a revised conceptual site model. An Ecological Risk Assessment was conducted and funded by PBA.

CLEANUP STRATEGY

Additional investigation is planned. Remediation such as waste removal and LTM may be needed.

STATUS

REGULATORY DRIVER: CERCLA

RAC: Serious Risk

CONTAMINANTS OF CONCERN:
Mustard

MEDIA OF CONCERN: Soil

PHASES	Start	End
PA.....	200203	200305
SI	200404	200602
RI/FS	201410	201509
RD	201510	201609
RA(C).....	201610	201709
LTM	201710	204709

RC: 201409

MMRP No Further Action Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	NFA Date
PBA-003-R-01	Mustard Burn Pit	SI determined NFA	200502
PBA-004-R-01	WP Slag Burn And Disposal Area	SI determined NFA	200502

Initiation of MMRP: 2002

Past Phase Completion Milestones

2004

SI (PBA-001-R-01, PBA-002-R-01
PBA-003-R-01, PBA-004-R-01)

Projected Construction Completion: 2017

Schedule for Five Year Reviews: Unknown

Estimated Completion Date of MMRP including LTM: 2047

Pine Bluff Arsenal MMRP Schedule

(Based on current funding constraints)

AEDB-R#	SITE TITLE	PHASE	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
PBA-001-R-01	BOMBING MAT VICINITY	RIFS									
		RD									2016
		RA(C)									2017
		LTM									2047
PBA-002-R-01	YELLOW LAKE BORROW AREA	RIFS									
		RD									2016
		RA(C)									2017
		LTM									2047

A Restoration Advisory Board (RAB) has not been formed at the Pine Bluff Arsenal (PBA) for the following reasons:

The majority of the cleanup and closure work for PBA Installation Restoration Program (IRP) sites was completed several years prior to 1994 when guidance for RABs was presented to installations.

All current activity associated with the IRP sites on PBA is in response to comments and negotiations with the Arkansas Department of Environmental Quality (ADEQ) in conjunction with the Corrective Measure Study (CMS) that was originally submitted in 1996. The CMS was submitted as a follow-up to completed remedial actions and is an effort to close out all of PBA's Solid Waste Management Units.

There have been no formal requests from regulatory agencies or the public to form a RAB.

Participation at public hearings for PBA's RCRA treatment, storage, and disposal facilities has been nearly 100% by PBA staff. The Arkansas Department of Environmental Quality (ADEQ) no longer requires PBA to conduct these hearings due to a lack of public participation.

PBA currently uses several methods to keep the local community apprised of actions that are planned and taking place. One of these is the Local Community/PBA Environmental Forum, where representatives of the local media, businesses, civic organizations, local government and environmental organizations are invited to hear presentations on current environmental activities and to provide their input.

PBA plans to make a public inquiry of interest in the establishment of a RAB in FY 06.